What is claimed:

1. A method for treating soot-containing exhaust gas with a wall-flow filter comprising the steps of:

(i) passing an exhaust gas over an oxidation catalyst disposed on a gas-impermeable zone along the wall-flow filter to convert an amount of NO in the exhaust gas to NO_2, wherein the wall-flow filter comprises a honeycomb arrangement defining:

(a) a plurality of first channels plugged at an upstream end, and

(b) a plurality of second channels not plugged at an upstream end, but plugged at a downstream end;

(ii) thereafter, trapping soot from the exhaust gas in a catalyst-free gas-impermeable zone disposed along the plurality of second channels; and

(iii) continuously combusting the trapped soot generated from step (ii) with the NO_2 produced from step (i), wherein the amount of NO_2 generated from step (i) is sufficient to enable combustion of the trapped soot in the catalyst-free gas-impermeable zone disposed along the plurality of second channels plugged at the downstream end at a temperature less than 400°C.

2. The method according to claim 1, wherein the wall-flow filter is made of a ceramic material selected from the group consisting of cordierite, alumina, mullite, silicon carbide, zirconia and sodium/zirconia/phosphate.

3. The method according to claim 1, wherein the plurality of first channels and the plurality of second channels are square, circular, rectangular, hexagonal or triangular in cross section.

4. The method according to claim 1, wherein the arrangement of the plurality of first channels and the plurality of second channels is such that laterally and vertically adjacent channels are plugged at opposite ends.

5. The method according to claim 1, wherein the honeycomb arrangement further comprises a plurality of third channels which are unplugged to provide a flow-through by-pass to the first and second channels.

6. The method according to claim 1, wherein the oxidation catalyst includes a platinum group metal.

7. The method according to claim 6, wherein the platinum group metal is selected from the group consisting of Pt, Pt/Rh, Pd/Rh or Pt/Pd/Rh.

8. The method according to claim 6, wherein the platinum group metal comprises at least one of Pt and Pd.

9. The method according to claim 1, further comprising after the exhaust gas passes through the gas permeable zone of the plurality of second channels, the step of absorbing NOx with a NOx absorber disposed along the gas impermeable zone of the plurality of first channels plugged at the upstream end.

10. The method according to claim 9, wherein the NOx absorber is selected from the group consisting of an alkali metal, alkaline earth metal, rare earth metal, and mixtures of any two or more thereof.

11. The method according to claim 9, wherein the NOx absorber includes an oxide of at least one of an alkali earth metal and an alkaline earth metal.

12. The method according to claim 11, wherein the alkali metal is potassium, sodium, lithium, rubidium or caesium or a mixture of any two or more thereof, the alkaline earth metal is barium, calcium, strontium or magnesium or a mixture of any two or more thereof.

13. The method according to claim 8, further comprising after the step of absorbing the NOx, the step of reducing NOx with a reduction catalyst or a Selective Catalytic Reduction (SCR) catalyst disposed downstream of the NOx absorber along the gas impermeable zone of the plurality of first channels plugged at the upstream end.

14. The method according to claim 13, wherein the step of reducing NOx is through use of the reduction catalyst

15. The method according to claim 14, wherein the NOx reduction catalyst comprises at least one platinum group metal.

16. The method according to claim 13, wherein the step of reducing NOx is through use of the SCR catalyst

17. The method according to claim 16, wherein the SCR catalyst includes copper-based materials, Pt, a mixed oxide of vanadium and titanium or a zeolite or mixtures of two or more thereof.

18. The method according to claim 16, wherein the SCR catalyst comprises $V_2O_5/WO_2/TiO_2$.

19. The method according to claim 1, further comprising before the step of passing the exhaust gas over the oxidation catalyst, the step of absorbing SOx on the gas-impermeable zone along the plurality of second channels.

20. The method according to claim 19, wherein the SOx absorber includes an alkaline earth metal oxide or alkali metal oxide or mixtures of any two or more thereof.

21. The method according to claim 20, wherein the alkali metal is potassium, sodium, lithium, rubidium or caesium or a mixture of any two or more thereof, and the alkaline earth metal is barium, calcium, strontium or magnesium or a mixture of any two or more thereof.

22. The method according to claim 1, wherein the wall-flow filter further comprises a high-surface oxide support comprising alumina, titania or zirconia for supporting the oxidation catalyst.

23. The method according to claim 19, wherein the support supporting the catalyst renders the zone including the oxidation catalyst substantially gas impermeable.

24. The method according to claim 1, further comprising increasing the local pressure drop of the wall-flow filter by a factor of at least 2 with the presence of the oxidation catalyst.

25. The method according to claim 1, further comprising increasing the local pressure drop of the wall-flow filter by a factor of at least 10 with the presence of the oxidation catalyst.

26. A method according to claim 1 for treatment of soot-containing exhaust from a combustion engine.

27. A method according to claim 1 for treatment of soot-containing exhaust from a diesel engine.

28. A process for treating soot-containing exhaust gas comprising the steps of first passing the soot-containing exhaust gas over an oxidation catalyst to convert NO in the exhaust gas to NO_2, then filtering the gas to deposit soot on a filter disposed in an exhaust system of a combustion engine wherein the exhaust gas containing NO_2 is used to combust the soot trapped on the filter, the amount of NO converted to NO_2 being sufficient to enable combustion of soot trapped on the filter to proceed at a temperature less than 400°C, wherein the filter is a wall-flow filter comprising: a honeycomb arrangement defining a plurality of first channels plugged at an upstream end and a plurality of second channels not plugged at the upstream end but plugged at a downstream end; the oxidation catalyst on a substantially gas impermeable zone at an upstream end of the second channels; and a catalyst-free gas permeable filter zone downstream of the oxidation catalyst for trapping soot.

29. The method according to claim 28, for treating exhaust gases from a combustion engine.

30. The method according to claim 28, for treating exhaust gases from a diesel engine.